

Case study: Gulf of Suez, Egypt

MAX-BRIDGE bridging solution tripled ROP, decreased mud losses 74%

As fields mature, permeable formations can become depleted, leading to differential sticking, wellbore instability, and whole mud losses. If one or more of these were to occur, it could significantly add to the cost of any drilling program in terms of contingency liners, fishing or sidetracking, non-productive time (NPT), or having to abandon the well.

In a highly-reactive shale environment in Abu Rudeis, an operator used a conventional polymer system to address these issues. This resulted in a low rate of penetration (ROP) and considerable fluid losses.

The operator contacted Baker Hughes to provide fluid engineering support at the end of the first year of drilling. Baker Hughes recommended the **MAX-BRIDGE™ advanced bridging solution** to mitigate the challenges.

The MAX-BRIDGE advanced bridging solution meets multiple challenges in wells where a fine line exists between wellbore stability, differential sticking, and mud losses.

The MAX-BRIDGE solution is comprised of a patented deformable sealing polymer in conjunction with resilient graphite additives to reduce pore pressure transmission, and seal and plug microfractures in shale and low-porosity sands.

By analyzing data in previous operations using the Baker Hughes **BRIDGEWISE™ engineering software**, a custom-designed solution was developed in the second year of drilling and generated immediate results. By the third year of drilling, the operator had the confidence to make a major change in casing design due to the ability of the MAX-BRIDGE solution to combine multiple pressure zones. By year four of drilling, the operator upgraded drilling technologies to a rotary steerable, which drastically improved ROP due to the improved wellbore stability and reduced downhole losses provided by the MAX-BRIDGE solution.

Challenges

- Highly depleted shale formation
- Low ROP
- Downhole fluid losses
- Wellbore instability

Results

- Improved ROP
- Decreased fluid losses
- Enabled use of rotary steerable system due to improved wellbore stability
- Reduced overall drilling NPT and casing requirements

MAX-BRIDGE Results

Compared to conventional polymer system

